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EXAMINER	
HSU, JONI	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/646,076	MONTRYM ET AL.	
	Examiner	Art Unit	
	Joni Hsu	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *October 30, 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25 and 27-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23,25,27-35 and 38-42* is/are rejected.

7)☒ Claim(s) *24,36,37,43 and 44* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 30, 2007 has been entered.

Response to Arguments

2. Applicant's arguments, see p. 14-16, and 20-23, filed October 30, 2007, with respect to rejections of claims 5-8, 11, 12, 14, 18, 20, 25, 27-31, and 38-42 under 35 U.S.C. 103(a) have been considered and are persuasive. So, rejection has been withdrawn. But, new ground(s) of rejection is made in view of Johns (US006366289B1), Liang (US 20020140655A1), and Fuchs.

3. As per Claim 28, Applicant argues that Fuchs does not teach the limitations of "said address associated with a virtual frame buffer" (page 14).

In reply, the Examiner points out that Johns is used to teach this limitation.

4. Applicant argues there is no motivation to combine Morein's (US006188394B1) invention directed to conserving memory resources and reducing sampling size with Fuchs' algorithm which is more costly, requires increased sample size, requires more memory resources to implement algorithm. "All teachings in the prior art must be considered" (MPEP 2143.01). As such, portions of Fuchs which teach away from Morein should be considered when evaluating alleged motivation to combine (p. 15). Features that add cost (e.g., maintaining 2 color buffers,

performing averaging for each pass, performing multiple passes) are related to determination of subpixel addresses, as such, shouldn't be ignored when evaluating motivation to combine (p. 16).

In reply, Examiner points out Morein teaches when pixel sample set cannot be reduced to compressed sample set, pointer is stored at frame buffer location corresponding to particular pixel. Pointer points to selected address in sample memory at which complete sample set for pixel is stored (c. 2, ll. 19-23). So, Morein teaches complete sample set for pixel is stored in sample memory, only Morein does not teach each sample is addressed by subpixel address. Fuchs also teaches complete sample set for pixel is stored in memory, and each subpixel is addressed by subpixel address (p. 119, 2nd col., 4th para). Passages in Fuchs cited by Applicant of maintaining two color buffers, performing averaging for each pass, and performing multiple passes are actually related to anti-aliasing technique used by Fuchs, and not to determination of subpixel addresses themselves. Fuchs teaches each subpixel already has subpixel address prior to performing of averaging for each pass and performing multiple passes. Maintaining of two color buffers is not required to determine subpixel addresses; instead, maintaining of two color buffers is required to store running average, which is performed after each pixel is already subdivided into grid of subpixels so that each subpixel has subpixel address (p. 119, 2nd col. 4th para). So, the determination of subpixel addresses themselves do not appear to add substantial cost, and so, the teachings of Fuchs which teach away from combination with Morein do not actually relate to the teaching from Fuchs that is used to reject the claims. The section of MPEP cited by Applicant goes on to recite "where the teachings of two or more prior art references conflict, the examiner must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another" (MPEP

2143.01). Since the teachings of Fuchs which teach away from combination with Morein do not actually relate to the teaching from Fuchs that is used to reject the claims, the degree to which Fuchs might accurately discredit Morein does not appear to be significant. One of ordinary skill in the art would still be motivated to combine the teaching of subpixel addresses from Fuchs into device of Morein since incorporating this teaching would not actually teach away from Morein, and because Fuchs suggests advantage of knowing the location of sample points within pixel at which to sample in order to perform anti-aliasing (p. 119, 2nd col., 3rd and 4th para.).

5. As per Claim 5, Applicant argues that a pitch value based upon pixels as taught by Dye (US005664162A) is not the same as a pitch value associated with subpixels (page 21).

In reply, Examiner agrees. However, new grounds of rejection are made in view of Liang.

6. As per Claim 7, Applicant argues Baldwin (US005594854A) fails to teach subpixels corresponding to pixel of virtual frame buffer having physical addresses that are nearby to each other (p. 22).

In reply, the Examiner agrees. However, Fuchs is now being incorporated into the combination to teach this limitation.

7. Applicant's arguments filed October 30, 2007 with respect to Claims 1-4, 9, 10, 13, 15-17, 19, 21-23, and 32-35 have been fully considered but they are not persuasive.

8. As per Claim 1, Applicant argues that merely storing a pointer as taught by Morein is not the same as transforming a memory address into a physical address (page 18).

In reply, Examiner points out Morein teaches pointer that is stored in **buffer location** (memory address) corresponding to particular pixel points to selected address (physical address) in a sample memory (frame buffer) utilized for antialiasing (c. 2, ll. 10-11, 18-22). Therefore, the

pointer translates or transforms the buffer location (memory address) that it is stored in into a selected address (physical address) in a sample memory (frame buffer) utilized for antialiasing.

9. Applicant argues that Johns does not teach a framebuffer utilized for antialiasing (p. 18).

In reply, the Examiner points out that main reference Morein is used to teach this.

10. Applicant argues physical address associated with pixel as taught by Johns is not the same as physical address associated with subpixel since pixel is different from a subpixel (p. 19).

In reply, Examiner points out Claim 1 recites "one physical address is associated with a plurality of subpixels." Main reference Morein teaches that one physical address is associated with plurality of subpixels for a pixel (c. 2, ll. 20-22). Johns teaches one physical address is associated with a pixel and generated using virtual frame buffer (c. 16, ll. 15-23, 55-67). This teaching from Johns is incorporated into device of Morein. So, frame buffer 36 of Morein is modified so that it is operated as a virtual frame buffer in the manner taught by Johns. Since Johns teaches one physical address is associated with a pixel and Morein teaches one physical address is associated with a plurality of subpixels for a pixel, when the teaching of the virtual frame buffer from Johns is incorporated into the device of Morein, the combination still teaches that one physical address is associated with a plurality of subpixels, as it is recited in Claim 1.

Claim Rejections - 35 USC § 103

11. Text of sections of Title 35, U.S. Code 103(a) not included can be found in prior action.

12. Claims 1-4, 9, 10, 13, 15-17, 19, 21-23, and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morein (US006188394B1) in view of Johns (US006366289B1).

13. As per Claim 1, Morein teaches providing antialiased memory access (c. 2, ll. 46-47; c. 4, ll. 9-13), comprising receiving request to access memory address (c. 4, ll. 9-13). Pointer that is

stored in **buffer location** (memory address) corresponding to particular pixel points to selected address (physical address) in sample memory (frame buffer) utilized for antialiasing (c. 2, ll. 10-11, 18-22). So, pointer translates or transforms buffer location (memory address) that it is stored in into selected address (physical address) in sample memory (frame buffer) utilized for antialiasing, at least one physical address is associated with plurality of subpixels for pixel and generated using frame buffer 36 (c. 2, ll. 19-23), frame buffer (sample memory 38) is single memory having data associated with plurality of subpixels (samples), plurality of subpixels correspond to at least one pixel of frame buffer 36 (c. 2, ll. 19-23, 25-31); and accessing data associated with subpixel at the at least one physical address within frame buffer (c. 4, ll. 9-13).

But, Morein does not teach frame buffer 36 is virtual frame buffer and determining if memory address is within virtual frame buffer and, if so, performing transforming and accessing. But, Johns teaches if memory address is within virtual frame buffer, memory address is transformed and driver manages memory to access data at transformed address (c. 16, ll. 15-23, 55-67), and if memory address is not within virtual frame buffer, then driver manages memory to access data at memory address (c. 15, ll. 56-62). So, since different operations are performed depending on whether or not memory access is within virtual frame buffer, this means there is determination as to whether memory access is within virtual frame buffer. Johns teaches determining if memory address is within virtual frame buffer and, if so, performing transforming and accessing (c. 16, ll. 15-23, 55-67). One physical address is associated with pixel and generated using virtual frame buffer (c. 16, ll. 15-23, 55-67). This teaching from Johns is incorporated into Morein. So, frame buffer 36 of Morein is modified so it is operated as virtual frame buffer in manner taught by Johns. Since Johns teaches one physical address is associated

with pixel and Morein teaches one physical address is associated with plurality of subpixels for pixel, when the teaching of virtual frame buffer from Johns is incorporated into Morein, the combination teaches that one physical address is associated with a plurality of subpixels.

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify Morein to include virtual frame buffer because Johns teaches display image being managed as virtual frame buffer appears as if it resides in frame buffer address space, but in actuality, display image is sub-divided into chunks distributed randomly in memory (c. 6, ll. 58-61), which requires less memory than conventional frame buffer (c. 2, ll. 11-14, 53-66).

14. As per Claims 2 and 22, Morein does not teach accessing data at memory address provided the memory address is not within virtual frame buffer. However, Johns teaches if memory address is within virtual frame buffer, memory address is transformed into physical address within frame buffer, and driver manages memory to access data at physical address within frame buffer (c. 16, ll. 15-23, 55-67). If memory address is not within virtual frame buffer, then driver manages memory to access data at memory address (c. 15, ll. 56-62).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Morein to include accessing data at memory address provided the memory address is not within virtual frame buffer because Johns suggests advantage of using video memory for frame buffer as well as for other clients such as compositor (c. 7, ll. 36-51; c. 9, ll. 31-33). If video memory is being accessed for frame buffer, then it is advantageous to use virtual frame buffer, as discussed for Claim 1. If video memory is being accessed for other clients such as compositor, then video memory can be directly accessed by compositor (c. 8, ll. 30-33).

15. As per Claims 3, 13, 19, and 23, Morein does not teach virtual frame buffer has predefined memory range of graphics memory. However, Johns teaches virtual frame buffer has predefined memory range of graphics memory (310, Fig. 3) (c. 16, ll. 15-23, 55-67; c. 15, ll. 56-62; c. 7, ll. 48-51). This would be obvious for same reasons given in the rejection for Claim 2.

16. As per Claim 4, Morein teaches memory address received from CPU (82; c. 8, ll. 43-45).

17. As per Claim 9, Claim 9 is similar to Claim 1, except that Claim 9 is for accessing data in order to read data. Morein describes accessing data in order to read data (c. 4, ll. 9-13).

18. As per Claim 10, Morein teaches providing subpixel value to a CPU (82; c. 8, ll. 43-52).

19. As per Claim 15, it is similar in scope to Claim 9, except it is for computer system further having at least one peripheral device coupled to processor coupled to memory, reading plurality of subpixel values and combining subpixel values. Morein teaches computer system having processor (82, Fig. 4) coupled to memory (94) (c. 8, ll. 43-45), reading plurality of subpixel (sample) values at plurality of physical addresses within frame buffer (38, Fig. 2; c. 4, ll. 9-13; c. 2, ll. 19-23), combining subpixel values to generate pixel value for specific pixel (c. 2, ll. 25-31).

However, Morein does not teach computer system further has at least one peripheral device coupled to the processor. However, Johns teaches computer system further has at least one peripheral device (40, 42, 49, Fig. 1) coupled to the processor (20) (c. 4, ll. 67-c. 5, ll. 17).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify device of Morein so computer system further has at least one peripheral device coupled to processor because Johns suggests these peripheral devices are needed in order for user to communicate with processor (c. 4, ll. 67-c. 5, ll. 17).

20. As per Claim 16, Morein teaches providing pixel value to a CPU (82; c. 8, ll. 21-25).

21. As per Claim 17, Morein teaches that the combining comprises blending the subpixel values into a single color value (c. 2, ll. 25-31).

22. As per Claim 21, Claim 21 is similar to Claim 1, except that Claim 21 is for accessing data in order to write data. Morein teaches accessing data in order to write data (c. 2, ll. 15-19).

23. As per Claim 32, Morein teaches receiving address in frame buffer 36 from computer program (c. 5, ll. 39-48; c. 9, ll. 64-c. 10, ll. 20); transforming received address into at least one subpixel (sample) address (c. 5, ll. 39-48; c. 5, ll. 59-c. 6, ll. 2), subpixel address being address into frame buffer (sample memory 38) which is single memory storing data of plurality of subpixels corresponding to each pixel of frame buffer 36, wherein the subpixel address is generated using frame buffer 36 (c. 2, ll. 19-23, 25-31); reading at least two subpixels from frame buffer (sample memory 38) using subpixel address (c. 4, ll. 9-14); blending at least two subpixels to create pixel value (c. 2, ll. 25-31); supplying created pixel value to computer program as if it were pixel value located at received address in frame buffer 36; computer program does not directly access frame buffer (sample memory 38) (c. 4, ll. 9-14).

However, Morein does not teach frame buffer 36 is virtual frame buffer, and supplying base address and buffer size information corresponding to virtual frame buffer. However, Johns teaches method for supplying virtual frame buffer to computer program, the method comprising supplying base address and buffer size information to computer program, base address and buffer size information corresponding to virtual frame buffer (c. 10, ll. 27-30; c. 16, ll. 34-44); receiving address in virtual frame buffer from computer program (c. 16, ll. 59-64); transforming received address (c. 17, ll. 1-3); reading data using transformed address; supplying data to

computer program as if it were pixel value located at received address in virtual frame buffer; and wherein the computer program does not directly access the frame buffer (c. 6, ll. 52-61).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify device of Morein to include supplying base address and buffer size information corresponding to virtual frame buffer as suggested by Johns. Johns suggests base address is needed in order to know where frame buffer starts, and all addresses can be calculated by adding certain offset to base address, which simplifying calculation of which chunk contains requested pixel address. Buffer size is needed in order to calculate correct address (c. 16, ll. 34-44). The advantages of using a virtual frame buffer were discussed in the rejection for Claim 1.

24. As per Claim 33, Morein does not teach that the computer program is an operating system. However, Johns teaches computer program is an operating system (35) (c. 4, ll. 64-67).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Morein so program is operating system because Johns teaches it is well-known in art to use operating system software to perform operations on memory (c. 1, ll. 42-51).

25. As per Claim 34, Morein does not teach that the computer program is a software driver. However, Johns describes that the computer program is a software driver (c. 13, ll. 8-20).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Morein to include software driver because Johns teaches using this driver allows host to choose memory managing scheme (c. 13, ll. 8-20), making scheme more flexible.

26. As per Claim 35, Morein teaches program 84 is application program (c. 8, ll. 16-21).

27. Claims 5, 6, 11, 12, 18, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morein (US006188394B1) and Johns (US006366289B1) in view of Dye (US005664162A), further in view of Liang (US 20020140655A1).

28. As per Claims 5 and 11, Morein and Johns are relied on for teachings above for Claim 4.

However, Dye describes providing the CPU (128, Fig. 1) with a pitch value of the frame buffer (110) (c. 7, ll. 59-66; c. 9, ll. 59-64; c. 12, ll. 10-17).

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify Morein and Johns to include providing CPU with pitch value of frame buffer because Dye teaches CPU needs to know pitch value of frame buffer in order to read data from correct location corresponding with virtual frame buffer (116) (c. 3, ll. 49-51; c. 12, ll. 1-24).

However, Morein, Johns, and Dye do no teach that the pitch value comprises a distance between two of the plurality of subpixels. However, Liang teaches this limitation [0002].

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify Morein, Johns, and Dye so pitch value has distance between two of plurality of subpixels because Liang suggests this value is needed in order to shrink the pitch to minimum, hence obtaining a very good sharpness of frame and increasing the area and window ratio of display pixels. The resolution of the display can thus be enhanced [0015].

29. As per Claims 6, 12, 18, and 25, Morein does not teach CPU calculating physical address within frame buffer using pitch value of frame buffer as pitch of virtual frame buffer. However, Dye teaches CPU 128 calculating physical address within frame buffer 110 using pitch value of frame buffer as pitch of virtual frame buffer 116 (c. 3, ll. 49-51; c. 12, ll. 1-24). This would be obvious for the same reasons given for Claim 5.

However, Morein and Dye doe not teach the pitch value comprises a distance between two of the plurality of subpixels. However, Liang teaches this [0002], as discussed for Claim 5.

30. Claims 7, 8, 14, 20, 27, and 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morein (US006188394B1) and Johns (US006366289B1) in view of Baldwin (US005594854A), further in view of Fuchs.

31. As per Claims 7 and 38, Morein and Johns are relied on for teachings above for Claim 1. The combination of Morein and Johns teaches plurality of subpixels corresponding to pixel are within virtual frame buffer, as discussed in the rejection for Claim 1.

But, Morein and Johns don't teach plurality of subpixels corresponding to pixel of virtual frame buffer have physical addresses that are nearby each other. But, Baldwin teaches buffer must reside at contiguous physical addresses, if virtual memory buffer maps to non-contiguous physical memory, then buffer must be divided into sets of contiguous physical memory pages (c. 18, ll. 45-52). So, data of virtual frame buffer have physical addresses that are nearby each other (c. 18, ll. 35-52). Baldwin teaches performing subpixel correction (c. 34, ll. 61-67).

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify Morein and Johns so data of virtual frame buffer have physical addresses that are nearby each other because Baldwin suggests this is needed because data in physical memory needs to be transferred together (c. 18, ll. 35-52).

However, Morein, Johns, and Baldwin do not teach that each physical address corresponds to one of the plurality of subpixels. However, Fuchs teaches pixel address (x, y) is subdivided into grid of subpixels so each subpixel has address of form (x+xoffset, y+yoffset)

(page 119, second column, fourth paragraph). So, each subpixel in grid of multiple subpixels has different xoffset and different yoffset, and so each subpixel has different physical address.

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify Morein, Johns, and Baldwin so each physical address corresponds to one of the plurality of subpixels because Fuchs teaches advantage of knowing location of sample points within pixel at which to sample in order to perform anti-aliasing (p. 119, 2nd col., 3rd- 4th para.).

32. As per Claims 8, 14, 20, 27, Morein does not teach physical addresses are based on base physical address which corresponds to memory address. But, Johns teaches this (c. 10, ll. 26-35).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Morein so physical addresses are based on base physical address because Johns teaches base physical address is needed as reference starting point, all addresses can be determined by their offsets from base physical address (c. 10, ll. 26-35).

33. As per Claim 39, it is similar in scope to Claim 32 except it is for writing pixel value and subpixels have nearby physical addresses. Morein teaches writing pixel value (c. 2, ll. 15-19).

However, Morein does not teach plurality of subpixels have nearby physical addresses. But, incorporating teachings from Baldwin and Fuchs teaches this, as discussed for Claim 7.

34. As per Claims 40-42, these claims are similar in scope to Claims 33-35 respectively, and therefore are rejected under the same rationale.

35. Claims 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morein (US006188394B1) in view of Fuchs, further in view of Johns (US006366289B1).

36. As per Claim 28, Morein teaches reading frame buffer (sample memory 38, Fig. 2; c. 2, ll. 19-23; c. 4, ll. 9-13), comprising receiving address corresponding to pixel (c. 2, ll. 18-20);

transforming received address into at least 1 subpixel (sample) address (c. 2, ll. 20-23; c. 2, ll. 25-31); reading at least 2 subpixels from frame buffer using at least 1 subpixel address (c. 4, ll. 9-13), frame buffer is single memory comprising plurality of pixels, each pixel has plurality of subpixels (c. 5, ll. 44-47; c. 2, ll. 25-31); and blending at least two subpixels to create pixel value for pixel (c. 2, ll. 25-31). Frame buffer stores uncompressed set of subpixels (c. 5, ll. 57-63).

But, Morein does not teach transforming received address into multiple subpixel addresses; using at least 2 of multiple subpixel addresses to read at least 2 subpixels. But, Fuchs teaches pixel address (x, y) is subdivided into grid of subpixels so each subpixel has address of form (x+xoffset, y+yoffset) (page 119, second column, fourth paragraph). So, each subpixel in grid of multiple subpixels has different xoffset and different yoffset, and so each subpixel has different address. So, received address (x, y) is transformed into multiple subpixel addresses since each of multiple subpixels has different address in form (x+xoffset, y+yoffset) since each of multiple subpixels has different xoffset and different yoffset. Fuchs teaches using at least two of multiple subpixel addresses to read at least two subpixels (p. 119, 2nd col., 4^{th} para).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify device of Morein to include transforming received address into multiple subpixel addresses; using at least two of multiple subpixel addresses to read at least two subpixels because Fuchs suggests advantage of knowing the location of the sample points within the pixel at which to sample in order to perform anti-aliasing (p. 119, 2nd col., 3rd and 4th para.).

However, Morein and Fuchs do not teach that the address is associated with a virtual frame buffer. However, Johns teaches this limitation, as discussed in the rejection for Claim 1.

37. As per Claim 29, Morein teaches supplying the pixel value as if it were a pixel value at the received address (c. 4, ll. 6-14).

38. As per Claim 30, Morein teaches writing frame buffer (38, Fig. 2) comprising receiving address and pixel value from computer program (84, Fig. 4; c. 2, ll. 19-21; c. 8, ll. 15-27), computer program supplying address and pixel value as if accessing frame buffer that does not comprise subpixels (samples); transforming received address into at least one subpixel address; writing pixel value to frame buffer as multiple subpixel values using at least one subpixel address (c. 2, ll. 19-23, 25-31) wherein frame buffer is single memory comprising plurality of pixels (c. 5, ll. 44-47) wherein each pixel comprises plurality of subpixels (c. 5, ll. 39-44).

But, Morein does not teach transforming received address into multiple subpixel addresses; writing pixel value as multiple subpixel values using multiple subpixel addresses. But, Fuchs teaches this (p. 119, 2nd col., 4th para.). This would be obvious for reasons for Claim 28.

However, Morein and Fuchs do not teach that the address is associated with a virtual frame buffer. However, Johns teaches this limitation, as discussed in the rejection for Claim 1.

39. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morein (US006188394B1), Fuchs and Johns (US006366289B1) in view of Toji (US007158148B2).

Morein, Fuchs, and Johns are relied upon for teachings as discussed relative to Claim 30.

But, Morein, Fuchs, Johns do not teach modifying one of multiple subpixel values in frame buffer based upon pixel value of surrounding pixel. But, Toji teaches this (c. 40, ll. 40-47).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify devices of Morein, Fuchs, and Johns to include modifying at least one of

multiple subpixel values in frame buffer based upon pixel value of surrounding pixel because Toji suggests the advantage of allowing a smoother image to be displayed (c. 2, ll. 58-65).

Allowable Subject Matter

40. Claims 24, 36, 37, 43, and 44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joni Hsu whose telephone number is 571-272-7785. The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on 571-272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JH

KEE M. TUNG
SUPERVISORY PATENT EXAMINER